

Undernutrition in Adults and Children: causes, consequences and what we can do

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Undernutrition^a occurs when people do not eat (or absorb) enough nutrients to cover their needs for energy and growth, or to maintain a healthy immune system. **Micronutrient deficiencies** are a sub-category of undernutrition and occur when the body lacks one or more micronutrients (e.g. iron, iodine, zinc, vitamin A or folate). These deficiencies usually affect growth and immunity but some cause specific clinical conditions such as anaemia (iron deficiency), hypothyroidism (iodine deficiency) or xerophthalmia (vitamin A deficiency).

Undernutrition is an important underlying cause of illness and death in Africa especially among women and young children – probably contributing to more than half the deaths among under-five year olds¹. In this article we examine the causes and effects of undernutrition at different ages, and give a brief overview of key actions. We hope that this will help you to plan preventive activities and obtain necessary resources.

Causes of undernutrition

We can divide the causes of undernutrition into *immediate*, *underlying* and *basic*.

Immediate causes are:

- **Poor diets.** Meals may be low in quantity, nutrient density or variety, or eaten infrequently. Infants may get insufficient breastmilk.

- **Disease** – particularly HIV/AIDS, diarrhoea, respiratory tract or ear infections, measles, hookworms and other gut parasites – see Box 1.

Underlying causes are family food insecurity, inadequate care of vulnerable household members (e.g. ‘unfair’ sharing of food within families), unhygienic living conditions (e.g. poor water supplies and poor sanitation) and inadequate health services.

Basic causes may include poverty, lack of information, political and economic insecurity, the aftermath of war, lack of resources at all levels, unequal status of women, and/or natural disasters.

Box 1. Undernutrition and infection ‘make each other worse’

Infections increase the risk of undernutrition because sick people eat less, absorb fewer nutrients, lose nutrients (e.g. in diarrhoea) and/or have increased nutrient needs (e.g. fever).

Undernutrition makes infections worse because:

- The body lacks anti-oxidants (to mop up harmful free radicals) and the nutrients needed to maintain immunity.
- The linings of the gut and respiratory systems are weak so pathogens can easily invade.

Undernutrition at different ages

The period during which undernutrition has the most severe consequences that often cannot be fully reversed is from conception until the age of two years.

Unborn and newborn babies

Undernutrition in the womb results in retarded growth and low birth weight (<2500g). A foetus is at risk if the mother was undernourished or anaemic *before* conception or if, during pregnancy, her diet is inadequate or she suffers from malaria, HIV or other infections. Specific maternal micronutrient deficiencies in early pregnancy can lead to severe disabilities such as brain damage of varying degrees (lack of iodine) and neural tube defect (lack of folate).

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^a The term ‘malnutrition’ is also used but this can include conditions related to ‘over-nutrition’ such as diabetes type 2 and cardiovascular disease. We no longer use the term ‘protein-energy malnutrition’ because undernutrition is the result of many nutrient deficiencies usually interacting with infection.

Low birth weight:

- Increases morbidity and mortality among neonates and infants.
- Retards emotional and intellectual development.
- Leads to permanently stunted height.
- Predisposes newborns to nutrition-related chronic diseases such as obesity, diabetes and cardiovascular disease in later life.

Infants and young children

Undernutrition below the age of six months is



rare unless a baby is not adequately breastfed or the baby or mother is HIV positive. 'Inadequate breastfeeding' means:

- Breastfeeds are infrequent or too short.
- Breast milk has been completely or partially replaced with a breastmilk substitute such as infant formula or cow's milk. This carries a high risk of undernutrition due to over-dilution or infection arising from unhygienic methods of preparation. Cow's milk also provides the wrong balance of nutrients for young babies.

Undernutrition and anaemia are common between the ages of six – 24 months because:

- By six months breastmilk alone cannot cover a baby's nutrient needs, especially for iron.
- Family foods (i.e. complementary/weaning foods) may be started too late or be unsuitable for young infants.
- These foods may not cover the increased nutrient needs if they are not 'nutrient dense' (i.e. are too watery) or are fed infrequently. Babies have small stomachs so need foods of high nutrient density and to be fed often.
- The risk of infection increases as infants:
 - lose immunity acquired from their mothers while still developing their own.
 - start new foods and drinks, become more active and meet more people.

The result of undernutrition is that growth slows and common childhood infections last longer and are more frequent and serious. Undernourished children are at high risk of permanently stunted growth and development (because they explore less and interact less with other people). Anything that reduces appetite (such as 'minor' infections or emotional stress) may tip a child into severe acute malnutrition.



Micronutrient deficiencies are also common at this age especially deficiencies of vitamin A (which can lead to xerophthalmia and always decreases immunity), iron (a leading cause of anaemia), zinc (which reduces immunity) and iodine (which causes hypothyroidism and so affects learning)¹.

School-age children and youths

Undernutrition is less common at this age because children:

- Have developed immunity to common infections and, until puberty, have relatively low nutrient needs for body weights.
- Can ask and seek for food.
- Have stomachs and appetites large enough for meals of low nutrient-density to satisfy nutrient needs.

Even so, many school-age children grow slower than they should, are anaemic and may lack other micronutrients. Many children are hungry, and hungry children are less able to learn, play and do physical work. At puberty nutrient needs increase dramatically due to rapid growth and increased activity. Anaemia is common especially among girls when they start menstruation. Adolescent still-growing girls who become pregnant are at high risk of undernutrition.

Adults

Women of reproductive age are at greater risk of undernutrition than other adults in Southern Sudan because:

- Energy and nutrient needs are high due to heavy workloads and frequent pregnancies.
- Iron needs increase during pregnancy, and blood is lost during menstruation and childbirth - so anaemia is common.
- Traditional food sharing behaviours in some households may result in women's diets being less adequate than those of men.

Maternal undernutrition increases the risk of morbidity and death and of having undernourished babies.

Higher energy needs², poor appetite and sometimes lack of food means any adult who is HIV positive is at risk of undernutrition. Undernutrition may increase the rate at which HIV progresses to AIDS.

When food is scarce all adults may become thin and undernourished and so have lowered immunity and lack energy.

Old people

It is often thought that undernutrition among old people is rare. But many old people are thin and/or anaemic. Old people are at risk of undernutrition if they:

- Have poor appetites – often resulting from illness or depression (e.g. due to loss of status in the family or death of a relative)
- Have eating difficulties because of lost teeth, sore gums, etc.
- Are poor, sick, mentally confused or disabled especially if there is no-one to shop, cultivate or cook for them.
- Have heavy workloads and/or are caring for young or ill relatives.



What can we do to improve nutrition?

Below is a short overview of key activities and



'messages' that you might be able to adapt and *prioritise* for your local situation^c. We all know that to improve nutrition-related behaviours it is best to *share* and *discuss* information (rather than *tell* people what to do). Then people feel free to discuss their problems, needs and ideas, and *together* you can identify behaviour changes that are practical, easy and acceptable.

Babies aged 0 – 6 months

Immediately after birth:

- Wait two minutes before cutting the umbilical cord so babies gets the maximum amount of blood.
- Make sure that babies:
 - start suckling within one hour of birth (unless they cannot suckle). First milk (colostrum) is nutrient-rich and protects against infections.
 - then suckle frequently – every 2- 3 hours.

Counsel mothers to *exclusively* breastfeed for the first six months^d. Breastmilk *alone* provides all the water and nutrients babies need.

Encourage families to:

- Give lactating mothers extra food.
- Bring babies to the clinic for weighing, check-ups and immunisations.
- Consult a health worker if the baby refuses to breastfeed.

Counsel parents on why and how to avoid pregnancy during lactation. Pregnancy does not 'spoil' breastmilk but does put more nutritional stress on the mother.

Children aged 6 months to 5 years

Advise families that:

^c We plan to give detailed guidelines in future issues of the Bulletin.

^d In *most* cases it is safer for mothers who are HIV+ to breastfeed provided they give no other food, milk or drinks (i.e. **exclusive breastfeeding**). The risk of death from feeding breastmilk substitutes (due to infection and undernutrition) is often very high and mixed feeding (feeding both breastmilk *and* a breastmilk substitute) increases the risk of virus transmission through the gut. The risk of transmission also increases if the lactating mother has a breast condition such as bleeding nipples or mastitis³.

- Breastmilk remains an important food for young children until they are at least two years old.
- By the age of six months children need to start family foods. These should:
 - be rich in energy and nutrients, and not watery. As well as porridges, meals should contain increasing amounts of groundnuts and beans, vegetables and fruits, and animal foods such as meat and fish whenever possible.
 - be started one at a time.
 - not be too peppery, salty or sugary.
 - be prepared hygienically. Animal milks should be boiled.
 - be soft and easy to eat.
- Young children need to breastfeed on demand and to eat *frequently*. At six months give meals 2-3 times a day increasing to 4 times a day by the age of one year. Avoid giving sugary or salty snacks.

Advise families to supervise mealtimes and encourage young children to eat, especially when sick – but never to force-feed.

Explain why it is important to bring children for immunisations and weighing and check-ups. Give appropriate advice, without blaming the parents, if a child is not gaining weight at the healthy rate.

Advise how to prevent infections such as malaria and diarrhoea, and make sure families know what to do if a child becomes sick, and how to feed during recovery⁴.

Give vitamin A supplements from the age of six months and continue until the child is 5 years old⁵.

When the time comes to stop breastfeeding, counsel mothers to stop *slowly* (unless advised otherwise^c), and check that they know to continue giving energy and nutrient rich meals *at least* three times a day with healthy snacks if needed.

School-age children

Explain that:

- Children need three meals a day - containing a variety of foods. Children study better if they have breakfast and a midday meal or snack.
- At puberty youths have high energy and nutrient needs and need bigger meals and snacks.

Counsel boys and girls why and how to avoid teenage pregnancy.

All adults

Advise families that all adults, including old people, need diets that provide:

- A *variety* of foods, especially groundnuts, peas and beans, and different fruits and vegetables.
- Animal foods, such as fish, meat and organ meats (e.g. kidney, guts), when available.

Explain that preventing infections helps to prevent undernutrition so promote:

- Washing hands with soap, ash etc. before handling food and after using the toilet.
- Sleeping under frequently-treated bednets. Avoiding malaria is especially important for pregnant women.

Discuss how to persuade sick people to eat and drink (e.g. by feeding frequently and offering small easy-to-eat meals). People who are HIV positive need nutrient-rich meals because they have increased energy needs^{e2}.

Women of reproductive age

Explain to families that:



- Women and girls need a good diet *throughout* life including *between* pregnancies - so they rebuild nutrient stores.
- Pregnant and lactating women need extra food especially iron-rich foods such as meat, liver and other organ meat, poultry and fish.
- Women need extra physical and psychological support during a pregnancy – especially if they are young.

^e Articles on nutrition and HIV, and anaemia are planned for future issues of the Bulletin.

- It is best to leave 2-3 years between pregnancies to allow women to build up nutrient stores.

Encourage pregnant women to attend antenatal clinics and explain why they need supplements of iron and folic acid^e.

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http://www.who.int/nutrition/publications/Content_nutrient_requirements.pdf
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4. WHO. *Pocket Book of Hospital Care for Children: Guidelines for the Management of Common Illnesses with Limited Resources*. WHO, Geneva. 2005.
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Recommended books and websites

- *Family Nutrition Guide*. 2004. Food and Agriculture Organization of the United Nations, Rome. (Request from nutrition@fao.org).
- *Improved Complementary Foods Recipe Book: Family Foods for Breastfed Children in Zambia*. 2007. National Food and Nutrition Commission, Zambia (download from <http://www.fao.org/docrep/010/ai208e/ai208e00.htm>)
- WHO Nutrition website: <http://www.who.int/nutrition/topics/infantfeeding/en/index.html>
- *The Lancet's Series on Maternal and Child Undernutrition* website: <http://www.globalnutritionseries.org>

Acknowledgements

Thanks to Dr Wani Mena for helping to prepare this article. Line drawings are by Rose Olendi or Anthony Okuku and from *Community Nutrition for Eastern Africa*. African Medical and Research Foundation. 1994.

We declare we have no conflicts of interest.